

Practitioner's Docket No. P-1000

PATENT

Preliminary Classification:

Proposed Class:

Subclass:

NOTE: "All applicants are requested to include a preliminary classification on newly filed patent applications. The preliminary classification, preferably class and subclass designations, should be identified in the upper right-hand corner of the letter of transmittal accompanying the application papers, for example "Proposed Class 2, subclass 129." M.P.E.P. § 601, 7th ed.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application

Assistant Commissioner for Patents

Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Stefan O. Dick; Michelle B. Martin; Roger Nobilet; Frederic Bouvier

WARNING: 37 C.F.R. § 1.41(a)(1) points out:

"(a) A patent is applied for in the name or names of the actual inventor or inventors.

"(1) The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.63, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(f) is filed supplying or changing the name or names of the inventor or inventors."

For (title): PACKAGING CONTAINER FOR ELECTRONIC COMPONENTS

CERTIFICATION UNDER 37 C.F.R. § 1.10*

(Express Mail label number is mandatory.)

(Express Mail certification is optional.)

I hereby certify that this New Application Transmittal and the documents referred to as attached therein are being deposited with the United States Postal Service on this date Aug. 28, 2000, in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EK985527007US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Dorothy Goodlett

(type or print name of person mailing paper)

Dorothy Goodlett

Signature of person mailing paper

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. § 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

***WARNING:** Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. § 1.10(b).

"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

(New Application Transmittal [4-1]—page 1 of 11)

JCS18 U.S. PTO
08/28/00

JCS42 U.S. PTO
08/28/00
0949903

09649033-002800

1. Type of Application

This new application is for a(n)

(check one applicable item below)

- ☒ Original (nonprovisional)
☐ Design
☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. § 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

WARNING: Do not use this transmittal for the filing of a provisional application.

NOTE: If one of the following 3 items apply, then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED and a NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION.

- ☐ Divisional.
☐ Continuation.
☐ Continuation-in-part (C-I-P).

2. Benefit of Prior U.S. Application(s) (35 U.S.C. §§ 119(e), 120, or 121)

NOTE: A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or copending international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or copending international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. § 112. Each prior application must also be:

- (i) An international application entitled to a filing date in accordance with PCT Article 11 and designating the United States of America; or
(ii) Complete as set forth in § 1.51(b); or
(iii) Entitled to a filing date as set forth in § 1.53(b) or § 1.53(d) and include the basic filing fee set forth in § 1.16; or
(iv) Entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(f) within the time period set forth in § 1.53(f).

37 C.F.R. § 1.78(a)(1).

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

WARNING: If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. §§ 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. §§ 120, 121 or 365(c). (35 U.S.C. § 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. §§ 119, 365(a) or 365(b).) For a C-I-P application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider canceling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

(New Application Transmittal [4-1]—page 2 of 11)

WARNING: When the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application **must** be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. See 37 C.F.R. § 1.78(a)(3).

- ☐ The new application being transmitted claims the benefit of prior U.S. application(s). Enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence.
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

5. Declaration or oath (including power of attorney)

NOTE: A newly executed declaration is not required in a continuation or divisional application provided that the prior nonprovisional application contained a declaration as required, the application being filed by all or fewer than all the inventors named in the prior application, there is no new matter in the application being filed, and a copy of the executed declaration filed in the prior application (showing the signature or an indication thereon that it was signed) is submitted. The copy must be accompanied by a statement requesting deletion of the names of person(s) who are not inventors of the application being filed. If the declaration in the prior application was filed under § 1.47, then a copy of that declaration must be filed accompanied by a copy of the decision granting § 1.47 status or, if a nonsigning person under § 1.47 has subsequently joined in a prior application, then a copy of the subsequently executed declaration must be filed. See 37 C.F.R. §§ 1.63(d)(1)-(3).

NOTE: A declaration filed to complete an application must be executed, identify the specification to which it is directed, identify each inventor by full name including family name and at least one given name, without abbreviation together with any other given name or initial, and the residence, post office address and country or citizenship of each inventor, and state whether the inventor is a sole or joint inventor. 37 C.F.R. § 1.63(a)(1)-(4).

NOTE: "The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.62, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(f) is filed supplying or changing the name or names of the inventor or inventors." 37 C.F.R. § 1.41(a)(1).

☒ Enclosed

Executed by

(check all applicable boxes)

☒ Inventor(s).

☐ legal representative of inventor(s).

37 C.F.R. §§ 1.42 or 1.43.

☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.

☐ This is the petition required by 37 C.F.R. § 1.47 and the statement required by 37 C.F.R. § 1.47 is also attached. See item 13 below for fee.

☐ Not Enclosed.

NOTE: Where the filing is a completion in the U.S. of an International Application or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

☐ Application is made by a person authorized under 37 C.F.R. § 1.41(c) on behalf of all the above named inventor(s).

(New Application Transmittal [4-1]—page 4 of 11)

(The declaration or oath, along with the surcharge required by 37 C.F.R. § 1.16(e) can be filed subsequently).

- ☐ Showing that the filing is authorized.
(not required unless called into question. 37 C.F.R. § 1.41(d))

6. Inventorship Statement

WARNING: If the named inventors are each not the inventors of all the claims an explanation, including the ownership of the various claims at the time the last claimed invention was made, should be submitted.

The inventorship for all the claims in this application are:

- ☒ The same.

or

- ☐ Not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,
☐ is submitted.
☐ will be submitted.

7. Language

NOTE: An application including a signed oath or declaration may be filed in a language other than English. An English translation of the non-English language application and the processing fee of \$130.00 required by 37 C.F.R. § 1.17(d) is required to be filed with the application, or within such time as may be set by the Office. 37 C.F.R. § 1.52(d).

- ☒ English
☐ Non-English
☐ The attached translation includes a statement that the translation is accurate. 37 C.F.R. § 1.52(d).

8. Assignment

- ☒ An assignment of the invention to Sud-Chemie Performance Packaging, Inc.
101 Christine Drive, Rio Grande Ind. Park, Belen, NM 87002
☒ is attached. A separate ☒ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.
☐ will follow.

NOTE: "If an assignment is submitted with a new application, send two separate letters—one for the application and one for the assignment." Notice of May 4, 1990 (1114 O.G. 77-78).

WARNING: A newly executed "CERTIFICATE UNDER 37 C.F.R. § 3.73(b)" must be filed when a continuation-in-part application is filed by an assignee. Notice of April 30, 1993, 1150 O.G. 62-64.

(New Application Transmittal [4-1]—page 5 of 11)

L0820306+1950

Country	Appln. No.	Filed
Country	Appln. No.	Filed
Country	Appln. No.	Filed

☐ is (are) attached.
☐ will follow.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. § 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES for NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

A. ☒ Regular application

CLAIMS AS FILED						
Number filed		Number Extra		Rate	Basic Fee 37 C.F.R. § 1.16(a)	
Total					\$780.00	\$690.00
Claims (37 C.F.R. § 1.16(c))	21	- 20 =	1	×	\$ 18.00	\$18.00
Independent Claims (37 C.F.R. § 1.16(b))	4	- 3 =	1	×	\$ 78.00	\$78.00
Multiple dependent claim(s), if any (37 C.F.R. § 1.16(d))				+	\$260.00	

- ☐ Amendment cancelling extra claims is enclosed.
- ☐ Amendment deleting multiple-dependencies is enclosed.
- ☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 C.F.R. § 1.16(d).

Filing Fee Calculation \$ 786.00

- B.** ☐ Design application
(\$310.00—37 C.F.R. § 1.16(f))

Filing Fee Calculation \$

(New Application Transmittal [4-1]—page 6 of 11)

- C. ☐ Plant application
(\$480.00—37 C.F.R. § 1.16(g))

Filing fee calculation

\$ _____

11. Small Entity Statement(s)

- ☐ Statement(s) that this is a filing by a small entity under 37 C.F.R. § 1.9 and 1.27 is (are) attached.

WARNING: "Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. The refiling of an application under § 1.53 as a continuation, division, or continuation-in-part (including a continued prosecution application under § 1.53(d)), or the filing of a reissue application requires a new determination as to continued entitlement to small entity status for the continuing or reissue application. A nonprovisional application claiming benefit under 35 U.S.C. § 119(e), 120, 121, or 365(c) of a prior application, or a reissue application may rely on a statement filed in the prior application or in the patent if the nonprovisional application or the reissue application includes a reference to the statement in the prior application or in the patent or includes a copy of the statement in the prior application or in the patent and status as a small entity is still proper and desired. The payment of the small entity basic statutory filing fee will be treated as such a reference for purposes of this section." 37 C.F.R. § 1.28(a)(2).

WARNING: "Small entity status must not be established when the person or persons signing the . . . statement can unequivocally make the required self-certification." M.P.E.P., § 509.03, 6th ed., rev. 2, July 1996 (emphasis added).

(complete the following, if applicable)

- ☐ Status as a small entity was claimed in prior application

_____ / _____, filed on _____, from which benefit is being claimed for this application under:

- 35 U.S.C. § ☐ 119(e),
☐ 120,
☐ 121,
☐ 365(c),

and which status as a small entity is still proper and desired.

- ☐ A copy of the statement in the prior application is included.

Filing Fee Calculation (50% of **A**, **B** or **C** above)

\$ _____

NOTE: Any excess of the full fee paid will be refunded if small entity status is established and a refund request are filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136, 37 C.F.R. § 1.28(a).

12. Request for International-Type Search (37 C.F.R. § 1.104(d))

(complete, if applicable)

- ☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

13. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.
(This and the surcharge required by 37 C.F.R. § 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ Filing fee \$ 786.00

☒ Recording assignment
(\$40.00; 37 C.F.R. § 1.21(h))
(See attached "COVER SHEET FOR
ASSIGNMENT ACCOMPANYING NEW
APPLICATION".) \$ 40.00

☐ Petition fee for filing by other than all the
inventors or person on behalf of the inventor
where inventor refused to sign or cannot be
reached
(\$130.00; 37 C.F.R. §§ 1.47 and 1.17(i)) \$ _____

☐ For processing an application with a
specification in
a non-English language
(\$130.00; 37 C.F.R. §§ 1.52(d) and 1.17(k)) \$ _____

☐ Processing and retention fee
(\$130.00; 37 C.F.R. §§ 1.53(d) and 1.21(f)) \$ _____

☐ Fee for international-type search report
(\$40.00; 37 C.F.R. § 1.21(e)) \$ _____

NOTE: 37 C.F.R. § 1.21(f) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 C.F.R. § 1.53(f) and this, as well as the changes to 37 C.F.R. §§ 1.53 and 1.78(a)(1), indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(f) must be paid, within 1 year from notification under § 53(f).

Total fees enclosed \$ 826.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 826.00

☐ Charge Account No. _____ in the amount of \$ _____

A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 C.F.R. § 1.22(b).

00000000000000000000000000000000

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

- ☒ 37 C.F.R. § 1.16(a), (f) or (g) (filing fees)
- ☒ 37 C.F.R. § 1.16(b), (c) and (d) (presentation of extra claims)

☐ 37 C.F.R. § 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☐ 37 C.F.R. § 1.17(a)(1)–(5) (extension fees pursuant to § 1.136(a)).

☐ 37 C.F.R. § 1.17 (application processing fees)

☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

NOTE: 37 C.F.R. § 1.28(b) requires "notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . the issue fee. . . ." From the wording of 37 C.F.R. § 1.28(b), (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

16. Instructions as to Overpayment

NOTE: "... Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

- ☒ Credit Account No. 03-3420
☐ Refund

009280*0064960



SIGNATURE OF PRACTITIONER

Reg. No. 31,945

Scott R. Cox

Tel. No. (502) 589-4215

(type or print name of attorney)

400 West Market St., Suite 2200

P.O. Address

Customer No.

Louisville, KY 40202

(New Application Transmittal [4-1]—page 10 of 11)

☒ **Incorporation by reference of added pages**

(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)

- ☐ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added _____

- ☐ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added _____

- ☐ Plus added pages deleting names of inventor(s) named in prior application(s) who is/are no longer inventor(s) of the subject matter claimed in this application.

Number of pages added _____

- ☒ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added seven (7)

☐ **Statement Where No Further Pages Added**

(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)

- ☐ This transmittal ends with this page.

P-1000

Title of Invention

PACKAGING CONTAINER FOR ELECTRONIC COMPONENTS

Background of Invention

1. Field of Invention.

5 This invention relates to packaging containers for electronic components. In particular, this invention relates to a packaging container for integrated circuits, wherein the composition of the cover for that packaging container includes a desiccating material and an electrostatic charge dissipating and / or anti-static material. In addition, this invention relates to a packaging container for integrated circuits, wherein the composition of the cover for that packaging container includes a desiccating material, an electrostatic charge
10 dissipating and / or anti-static material and a humidity indicating system.

2. Prior Art.

20 Electronic components, such as integrated circuits ("IC"), are conventionally shipped from a factory to the user in large quantities. To protect these ICs during transportation, they are generally secured in special trays. Sections CO-027 - CO-032 and CO-034, and sections CS-002 - CS-008 of JEDEC publication, JEP95, contain outlines and specifications for standardized thin and thick matrix trays

for various IC types.

Plastic integrated circuit devices are susceptible to moisture due to the permeable nature of their plastic components. It is well known that ICs, which have been contaminated by high levels of moisture, may not be useful. Mechanical failure of such moisture contaminated ICs often leads to the subsequent failure of the device which contains the IC due to thermal and mechanical stress. Accordingly, exposure of ICs to moisture should be limited.

For specialized types of packaging for ICs, refer to U.S. 4,971,196, U.S. 5,095,626, U.S. 5,293,996 and U.S. 5,295,297. Each of the packaging containers disclosed by these patents incorporates a moisture indicator device into the packaging container, which device is secured to the inside surface of the container. See specifically Figures 7 and 10 of these patents.

Specifically, U.S. Patent No. 5,293,996 discloses a packaging container for integrated circuits containing an observation window. The container is divided into three sections, wherein one of those sections contains a compartment (11) housing a humidity indicator device (16). The humidity indicator device (16) is preferably a humidity indicator card. As best understood the card is merely placed within the compartment for viewing. The composition

of the packaging material of the compartment containing the humidity indicator card is a transparent plastic which permits the moisture indicator card to be viewed from outside of the packaging container.

5 U.S. Patent No. 5,318,181 discloses compartmentalized humidity sensing indicators. These humidity sensing indicators are produced on a tape reel and are secured to the inside surface of a continuous strip of humidity indicators.

10 U.S. Patent No. 2,446,361 discloses a humidity indicating moisture adsorbent product secured to packaged goods. The product comprises a container (A) onto which is secured a receptacle (B). Contained within the receptacle (B) is a desiccant (C). The receptacle (B) is transparent and may be formed from plastic materials. It is screwed into a threaded mounting apparatus which is also secured to the container. It is comprised of a cylindrical wall (16), closed top (17) and a perforated bottom (18). The receptacle (B) is secured in place to the package by a collar (20) and a locking ring (22) containing threads (24, 28). The receptacle (B) may be screwed in place using one of two different designs as disclosed in Figures 2 and 3 of the patent.

20 See also U.S. Patent No. 5,238,648 which discloses a

view port in packaging through which can be viewed an oxygen indicator device.

In addition to their susceptibility to moisture, ICs can also be damaged by static electricity. Therefore, it is important that the packaging for such electronic components also be resistant to electrostatic charge. This resistance should be present in the tray on which the ICs are stored as well as in the moisture-proof bag in which the tray is shipped. A laminated packaging system for ICs, which is resistant to static charge is disclosed in U.S. 5,136,827 and U.S. 4,568,416.

It is well known that electronic components are also sensitive to particles and dust. Therefore, manufacturing and assembly of electronic devices is performed in clean rooms of class 100 - 10.

Current packaging products which are used to ship integrated circuits still exhibit deficiencies, including limitations caused by the composition of the packaging material. Conventionally, the packaging material used for shipping integrated circuits is opaque, thus preventing easy inspection of conventional humidity indicator cards which are contained within the packaging unless the packaging material is breached. In certain new packaging materials, the composition of the surface of the packaging is different

from the composition of the remaining portion of the packaging that is adjacent to the humidity indicator so that the humidity indicator card can be viewed from outside of the packaging.

5 In addition, the method for attachment of the humidity indicator device to the inside surface of the packaging material is often not practical.

10 Further, packaging products for shipping integrated circuits often must include desiccant products because of the sensitivity of the integrated circuits to moisture. Several plastic materials which may be used for packaging have been produced which have incorporated moisture absorbing products, such as desiccating materials, into their structure. For example, U.S. Patent No. 5,911,937
15 discloses a product made from 30 to 80 percent desiccant, 20 to 40 percent thermoplastic and 5 to 20 percent of a channeling agent, wherein the channeling agent includes any hydrophillic material which is miscible with a polymer-based matrix upon melt mixing to form the channeled structure.
20 These compounds preferably include polar compounds having at least several hydroxy groups, such as polyglycols. The desiccants that can be incorporated within this plastic material include anhydrous salts, molecular sieves, silica gels, clays and starches. See also WO 96/33108.

A number of other plastic materials have been produced into which desiccating products have been incorporated. For example, U.S. Patent No. 5,078,909 discloses a moisture absorbent product comprising 100 parts by weight of a thermoplastic resin and 5 to 400 parts of a desiccant. U.S. Patent No. 5,432,214 discloses a plastic product containing a desiccant comprising 50 - 80% of a thermoplastic or thermosetting product, 20 - 50% of a dehydrating agent, 2 - 8% of an elastomer and 1 - 4% fibers. EP 432,438 discloses a desiccating plastic product comprising 100 parts of an absorbent particles mixed with 10 to 50 parts of a plastic particle and a reinforcing fiber. U.S. Patent No. 4,061,807 discloses a desiccating product containing 60 to 95 parts of absorbent granules mixed with 50 to 40 parts of a thermoplastic particles. U.S. Patent No. 5,591,379 discloses a coating or adhesive material which is placed on packaging for micro-electronic devices. A desiccant product is dispersed in the binder to form the coating or adhesive. The binder may include a number of polymers.

U.S. Patent No. 4,013,566 discloses a desiccant combined with a thermoset material. U.S. Patent No. 4,665,050 discloses a desiccant that is embedded in a plastic without melting the plastic. U.S. Patent No. 3,245,946 discloses a desiccant incorporated into a rubber

product for absorbing the moisture contained within the rubber product. U.S. Patent Nos. 4,792,484 and 4,407,897 disclose the use of EVOH copolymers with particular products including conventional desiccant materials. See also U.S. Patent Nos. 5,496,397 and 5,401,706.

U.S. Patent No. 5,702,508 discloses a moisture removing device comprising a ceramic shell with a plurality of parallel openings. The openings form elongated structure surfaces adapted to be in contact with moisture laden air moving through the openings. The surfaces have desiccant capabilities.

U.S. Patent No. 4,665,050 discloses a self-supporting structure wherein 1 to 7 percent polymer is mixed with absorbent particles to form a sorbent product. U.S. Patent No. 4,427,992 discloses a desiccant for semi-conductor products which may be applied in liquid form and consist of ethyl-alcohol, ethyl-acetate water and a source of boron, alumina or phosphorous and organic silane.

Finally, DE 4,013,799 discloses an insert for containers, particularly for medicines and semi-luxury consumer goods, wherein a granular drying agent is embedded in plastic.

As referenced above, integrated circuits are particularly susceptible to moisture and can also be damaged

by static electricity. Further, these components are particularly sensitive to dust. Accordingly, in the prior art integrated circuits have been prepared for shipping using a complicated and expensive process which includes at least the following process steps:

- a) inserting the integrated circuits into trays;
- b) baking the integrated circuits dry on the trays;
- c) stacking the trays on top of each other;
- d) covering the tray stack with a tray cover;
- e) inserting the covered tray stack in a moisture and water-proof bag;
- f) inserting desiccant bags into the moisture-proof bag;
- g) placing a humidity indicator card into the bag;
- and
- h) sealing the bag.

An alternative procedure included at least the following steps:

- a) baking the integrated circuits dry separately from the packing trays;
- b) inserting the dried integrated circuits into the trays;
- c) stacking the trays on top of each other;
- d) covering the tray stack with a tray cover;

e) inserting the covered tray stack in a moisture and water-proof bag;

f) inserting desiccant bags into the moisture-proof bag;

g) placing a humidity indicator card into the bag; and

h) sealing the bag.

In addition to the fact that this process is complicated, labor-intensive and time-intensive, the integrated circuits are protected from moisture only after the moisture-proof bag is sealed. Integrated circuits can still absorb moisture at any time from their original baking until the sealing of the bag.

Another disadvantage of the prior art processes is that the integrated circuits are also exposed to dust for a greater period of time. This dust may even include generated dust from the desiccant bags themselves.

Accordingly, it is an object of this invention to prepare a packaging container for electronic components which reduces the level of moisture within the container during shipment.

It is still further object of the invention to disclose a packaging container for electronic components, wherein the composition includes a desiccant product.

It is still further object of the invention to disclose a packaging container for electronic components which incorporates an electrostatic charge dissipating and/or anti-static material into the composition of the packaging container.

It is still further object of the invention to disclose a packaging container for integrated circuits which produces less dust and other particulate matter during packaging and shipment.

It is still further object of the invention to utilize a process for loading electronic components that has fewer steps and reduces the time and expense of the packaging process.

These and other objects and features of the present invention will become apparent to those skilled in art from a consideration of the following detailed description, drawings and claims. The description along with the accompanying drawings provides a selected example of the construction of the device and its process of manufacturing to illustrate the invention.

Summary of the Invention

In accordance with the present invention there is provided a packaging container for electronic components, which components are sensitive to humidity, which includes

trays for holding the electronic components, and
a tray cover, whose composition comprises a plastic
material, an electrostatic charge dissipating and/or anti-
static material and a desiccant for absorbing moisture
5 contained or penetrating into the packaging container.

Alternatively, the present invention provides a
packaging container for electronic components, which
components are sensitive to humidity, which includes

trays for holding electronic components,
10 a tray cover, whose composition comprises a plastic
material, an electrostatic charge dissipating and/or anti-
static material and a desiccant for absorbing moisture
contained or penetrating into the packaging container during
shipment, and

15 a humidity indicating system secured to the tray cover
for determining the humidity level within the packaging
container.

The present invention further includes the packaging
container discussed above placed within a moisture-proof
20 barrier bag for shipment.

The present invention further includes a process for
the filling and shipping of a packaging container with
integrated circuits comprising

introducing integrated circuits into shipping trays;

baking the integrated circuits while in the trays to
remove moisture;

securing a tray cover onto a stack of the baked trays,
wherein the tray cover is comprised of a plastic material,
an electrostatic charge dissipating and/or anti-static
material and a desiccant for absorbing moisture contained or
penetrating into the packaging container; and

placing the covered tray stack containing integrated
circuits within a moisture-proof barrier bag.

Alternatively, the present invention includes a process
for the filling and shipping of a packaging container with
the integrated circuits comprising

introducing dry, baked integrated circuits into
shipping trays;

securing a tray cover onto a stack of the trays,
wherein the tray cover is comprised of a plastic material,
an electrostatic charge dissipating and/or anti-static
material and a desiccant for absorbing moisture contained or
penetrating into the packaging container; and

placing the covered tray stack containing integrated
circuits within a moisture-proof barrier bag.

Brief Description of the Drawings

This invention will now be described with reference to
the accompanying drawings in which

Figure 1 is the packaging container of the present invention.

Figure 2 is the packaging container of the present invention into which has been incorporated a humidity indicator card.

Figure 3 is a prior art system for shipment of integrated circuits.

Figure 4 is a top view of the tray cover of the packaging container of Figure 1.

Figure 5 is a top view of a humidity indicator disk and clear plastic disk which are mounted into the tray cover of Figure 4.

Figure 6 is a top view of an individual tray with an integrated circuit placed thereon.

Figure 7 is a top view of a stack of trays.

Detailed Description of the Preferred Embodiment

Electronic components, such as semi-conductor chips or integrated circuit chips, after manufacture and prior to utilization, are temporarily stored using a number of different storage systems. Current dry packing practices involve baking such electronic components until dry, placing them into a dry pack with desiccant bags and humidity indicator cards, sealing the bag immediately and shipping the sealed bag to the customer.

Prior art packaging containers (110) as shown in Figure were comprised of stacks of trays (120) and a tray cover (130). The packaging container (110), a humidity indicator device (140) to determine the moisture content of the air within the barrier bag (150), and desiccant bags (160) were placed in a barrier bag (150).

The components of the packaging container (10) of the present invention as shown in Figures 1 and 2 contain fewer components than the packaging container (110) of the prior art as shown in Figure 3. Prior to packaging, the electronic components, such as integrated circuits (22), are first placed on or within an individual tray (21) as shown in Figure 6. Any reasonable design for these trays (21) may be utilized to secure the integrated circuits during transport. However, the design of standardized trays has been established under the JEDEC tray convention, according to JEP 95.

A tray cover (30) of the invention is designed to cover the stacked trays (20). The tray cover (30) is manufactured from at least one thermoplastic or thermosetting plastic material, at least one desiccant material and preferably at least one material that contains electrostatic discharge or anti-static properties. The tray cover (30) may also contain one or more elastomers, fibers, channeling agents,

processing aids, stabilizers and pigments, as desired.

Well known plastic materials may be used to form the cover (30) include polyethylene, ethylene copolymers (e.g. EVA), polypropylene, polybuten-1, polyisobutylene, polyvinylchloride, vinylchloride copolymers, polyvinylidene chloride, polystyrene, styrene copolymers, cellulose derivatives, polyamide, polycarbonate, polyoxymethylene, polyethyleneterephthalate, polybutyleneterephthalate, copolyester, polyphenylenoxides, polymethymethacrylate, acrylate copolymers, flourine containing polymers, polyphenylenesulphide, polyarylsulphones, polyaryletherketones, polyetherimids, polyimids, thermoplastic elastomers, polyurethanes, phenol resins, melamine resins, urea resins, epoxy resins and unsaturated polyester resins. Combinations of these plastic products may also be used to form the cover (30). In a preferred embodiment the tray cover (30) is prepared from a polypropylene material such as Moplen EPL 31 UA copolymer, produced by Montell.

A desiccant product is next incorporated into the thermoplastic and/or thermosetting plastic material. The desiccant product may be one or more selected from the groups of desiccating agents such as silica gel, a desiccant clay, activated alumina, calcium oxide, barium oxide,

5 natural or synthetic zeolites (including molecular sieve compounds) or the like, or deliquescent salts such as magnesium sulfate, calcium chloride, aluminum chloride, lithium chloride, calcium bromide, zinc chloride, or the like. In a preferred embodiment, a molecular sieve such as NK 10 AP, produced by Ceca, is incorporated into the plastic material.

10 The composition for the tray cover (30) also preferably includes a material which introduces electrostatic charge dissipating and/or anti-static properties to the plastic material, and is selected from the group consisting of carbon products, anionic surfactants, cationic surfactants, amines, amides, ethoxylated fatty amines, ethoxylated fatty amides and hydrophilic graft copolymers. In a preferred
15 embodiment, a carbon black such as Printex XE2, produced by Degussa, is incorporated into the plastic material.

20 Other materials may also be incorporated into the composition of the tray cover (30) including elastomers, such as Kraton G 1650, a styrene-ethylene-butadiene-styrene copolymer (SEBS), produced by Shell.

In a preferred embodiment the composition of the tray cover (30) is preferably a polypropylene plastic material comprising from about 20 to about 60 percent of the composition of the tray cover (30), preferably from about 30

to about 50 percent. Preferably the desiccant material is a molecular sieve, such as NK 10 AP produced by CECA, and comprises from about 30 to about 80 percent of the composition of the tray cover (30), preferably from about 40 to about 65 percent. The electrostatic charge dissipating material comprises from about 2 to about 10 percent of the composition of the tray cover, preferably from about 3 to about 8 percent, with the remaining components formed from other conventional additives, such as elastomers, processing aids and pigments. All percentages are by weight.

The process used for forming the tray cover includes the following steps:

a) The polypropylene and SEBS are fed into the main feeder of an extruder and heated.

b) The molecular sieve and carbon black products are fed into the extruder via a lateral feeder.

c) The mixture is degassed several times, preferably under vacuum.

d) The mixture is then pressed through a die, cooled and pelletized.

e) The pelletized material is melted, and the tray cover is injection molded using conventional procedures.

Alternatively, the tray cover (30) may be formed by thermaforming or other conventional means of forming plastic

material.

The tray cover (30) may be formed in any conventional shape or structure that covers the trays (20) for the integrated circuits. Notwithstanding, it preferably complies with the standards set by JEDEC, namely JEPGS.

During the formation of the tray cover (30), an opening is preferably formed in the cover (30). This opening is designed to hold the humidity indicator device (40). The size and shape of this opening depends upon which humidity indicator device (40) is secured to the tray cover (30).

In a preferred embodiment the opening for the humidity indicator (40) is circular. Into this circular opening is placed a clear plastic circular disk (42) as shown in Figures 4 and 5. This clear plastic circular disk (42) can be manufactured from any clear plastic material, preferably from copolyesters like Durastar DS2000 produced by Eastman Chemicals. This clear plastic circular disk (42) covers the opening to prevent water and water-vapor from passing into the interior of the packaging container (10).

Secured to the inside of the clear plastic circular disk (42) is the humidity indicator element (44). The humidity indicator element (44) is preferably formed from a hydrophilic blotter substrate onto which is placed a humidity indicator solution which readily discloses the

level of humidity in the air surrounding the disk (42) by changing its color depending on the level of humidity present. This substrate and humidity indicator solution are well known in the industry. The substrate is preferably blotter paper, for example, manufactured by Custom Paper. Preferably, the humidity indicating solution comprises a solution of cobalt chloride. The preferred cobalt chloride solution is also well known in the industry and is hygroscopic in nature. It demonstrates different colors or different degrees of color based on the amount of moisture in the air surrounding the humidity indicator element (44). The humidity indicator solution is incorporated onto the humidity indicator substrate by conventional means.

Once the humidity indicator solution has been secured onto the substrate, the substrate is formed into the desired shape for use as the humidity indicator element (44). The humidity indicator element (44) is preferably formed into a circular shape as shown on Figures 4 and 5.

In order to determine the level of humidity which is indicated by the color of the humidity indicator element (44), a conventional humidity comparison element (not shown) is preferably secured next to the humidity indicator element (44). The humidity comparison element, which is preferably formed from a material which is not affected by

the level of humidity present in the packaging container (10), is used to compare the level of the humidity shown on the humidity indicator element (44) against known levels of humidity shown by different colors on the humidity comparison element. The humidity comparison element of the preferred embodiment is preferably round with a circular opening cut into its middle.

The humidity indicator element (44) is preferably secured to the back of the humidity comparison element by conventional means, such as by an adhesive. By securing the humidity indicator element (44) to the humidity comparison element with a portion of the humidity indicator element (44) which is sensitive to humidity covering a circular opening in the middle of the humidity comparison element, it is easy for a viewer of this assembly to determine the relative humidity level within the container by merely comparing the color shown on the humidity indicator element (44) with the various colors referenced on the humidity comparison element. The size and shape of the humidity indicator element (44) and humidity comparison element can be altered from that shown in Figures 4 and 5. In addition, a single color humidity comparison element may be substituted for a multicolored humidity comparison element.

Once the electronic components to be shipped have been

placed within the packaging container (10), the humidity within that container can be readily checked merely by viewing through the clear plastic disk (42) that is secured to the inside surface of the packaging container (10). Any water vapor inside the packaging container (10) will contact with the humidity indicator element (42) and produce a change in its color which then discloses the moisture content of the air within the packaging container (10). By comparing the color of the humidity indicator element (42) with the color shown on the humidity comparison element, the level of humidity within the packaging container can be readily determined.

In the preferred embodiment the packaging container (10) is placed within a water-proof barrier bag (50). The composition of the water-proof packaging bags is preferably a multi-layer composite of polymer films and aluminum foil. In one preferred embodiment the water and vapor-proof packaging material is DRI-PAK® manufactured by Richmond Technologies.

In forming the packaging container (10) of the present invention, the trays (20) are first formed from conventional material. The tray cover (30) is then formed. In a preferred embodiment the tray cover (30) is produced from a plastic material, an electrostatic charge dissipating

material and/or anti-static material and a desiccating material, preferably a molecular sieve material as discussed above. An opening may then be cut into the cover (30). The humidity indicator device (40) including the humidity indicator element (44) and the circular disk (42) are then secured together by adhesive or other sealing systems. The humidity indicator device (40) is then secured through the opening to the surface of the packaging container (10) preferably on the inside surface. This humidity indicator device (40) seals the opening in the tray cover (30) completely.

The integrated circuits are then introduced into the trays (20) as shown in Figure 6, and the trays (20) are stacked on each other to form tray stacks (20) as shown in Figure 7. These tray stacks (20) with the integrated circuits are then baked to dry the integrated circuits and the tray cover (30) is placed over the tray stack (30) to close the tray stack. Once the tray cover (30) is closed onto the tray stack (20) to form the packaging container (10), the packaging container (10) is then inserted into the water and moisture-proof barrier bag (50) and the bag (50) is sealed.

Alternatively, the integrated circuits may be baked dry on separate carriers and introduced already dry into the

trays which are then stacked on each other to form a tray stack (20). The tray cover (30) is then placed over the tray stack (20). Once the tray cover (30) is closed onto the tray stack (20) in order to form the packaging container (10), the packaging container (10) is inserted into the water and moisture-proof barrier bag (50) and the bag (50) is sealed.

As stated above, the preferred tray cover (30) according to this invention already contains a humidity indicator device (40) as an integral part of its design. Alternatively, a tray cover (30) according to this invention without a humidity indicator device as an integral part of its design can be used. In this case a conventional humidity indicator device (140) is inserted into the water and moisture-proof bag (50) prior to sealing.

By using the tray cover (30) of the particular composition, according to the invention, several processing steps can be eliminated creating a faster process and decreasing the overhead costs. In addition, this new process reduces the time of potential exposure of the integrated circuits to moisture. Further, the problem of dust being present within the trays (20) is reduced if not eliminated as a result of the desiccant material being encapsulated within the tray cover (30). In addition, as

the desiccant material is already contained in the tray cover (30), no additional weight or volume from desiccant bags has to be added to the packaging container (10).

By having a humidity indicator device (40) secured into the cover (30) of the packaging container (10), the consumer of the integrated circuits can determine merely by looking at the humidity indicator element (44) whether the level of humidity within the packaging container (10) is too high. If so, the integrated circuits may be re-baked to lower the level of the moisture present therein.

It will be apparent for the foregoing that while particular forms of the invention have been illustrated and described, various modifications can be made without departing from the spirit and scope of the invention.

Claims

1. A packaging container for integrated circuits comprising

a tray for holding integrated circuits, and

5 a tray cover, wherein the composition of the tray cover comprises a plastic material, an electrostatic dissipating charge material, and a desiccating material for adsorbing moisture contained within the packaging container.

10 2. The packaging container of Claim 1 further comprising a humidity indicator device secured to the tray cover, which indicator device determines a humidity level within the packaging container.

15 3. The packaging container of Claim 2 wherein the humidity indicator device is secured into an opening in the tray cover.

4. The packaging container of Claim 1 wherein the plastic material of the tray cover comprises a polypropylene.

20 5. The packaging container of Claim 2 wherein the humidity indicator device comprises a humidity indicator element and a system for securing the humidity indicator element to the tray cover.

6. The packaging container of Claim 5 wherein the humidity indicator element comprises a hydrophillic blotter

substrate onto which a humidity indicator solution has been placed.

7. The packaging container of Claim 6 wherein the humidity indicator solution comprises cobalt chloride.

5 8. The packaging container of Claim 2 wherein the humidity indicator device is secured to the tray cover using a clear, plastic disk mounted within the opening in the tray cover.

10 9. The packaging container of Claim 1 further comprising a water and moisture-proof barrier bag into which the tray is secured.

15 10. A packaging container for integrated circuits comprising

a tray for holding integrated circuits,

20 a tray cover, wherein the composition of the tray cover comprises a plastic material, an electrostatic dissipating charge material, and a desiccating material for adsorbing moisture contained within the packaging container,

a humidity indicator device secured to the tray cover for determining the humidity level within the packaging container; and

a moisture-proof barrier bag into which the tray and the tray cover are placed.

11. The packaging container of Claim 10 wherein the

humidity indicator device is secured into an opening in the tray cover.

12. The packaging container of Claim 10 wherein the composition of the tray cover further comprises an anti-static material.

13. The packaging container of Claim 10 wherein the plastic material of the tray cover comprises a polypropylene.

14. The packaging container of Claim 10 wherein the humidity indicator device comprises a humidity indicator disk and a system for securing the humidity indicator disk to the tray cover.

15. The packaging container of Claim 14 wherein the humidity indicator disk comprises a hydrophillic blotter substrate onto which a humidity indicator solution has been placed.

16. The packaging container of Claim 15 wherein the humidity indicator solution comprises cobalt chloride.

17. The packaging container of Claim 11 wherein the humidity indicator device is secured to the tray cover using a clear plastic disk mounted within the opening in the tray cover.

18. A process for filling and shipping of a packaging container containing integrated circuits comprising

introducing integrated circuits into a tray,
baking the integrated circuits while in the tray to
reduce the water content in the integrated circuits,
securing a tray cover over the tray, wherein the tray
cover is comprised of a plastic material, an electrostatic
charge dissipating material and a desiccating material for
absorbing moisture contained within the packaging container;
and

placing the covered tray containing integrated circuits
within a moisture-proof barrier bag.

19. A process for filling and shipping of a packaging
container containing integrated circuits, comprising

introducing dry, baked integrated circuits into a
shipping tray,

securing a tray cover over the tray, wherein the tray
cover is comprised of a plastic material, an electrostatic
charge dissipating material and a desiccating material for
absorbing moisture contained within the packaging container;
and

placing the covered tray containing dry baked
integrated circuits within a moisture-proof barrier bag.

20. The process of Claim 18 wherein the tray cover
further comprises a humidity indicator device.

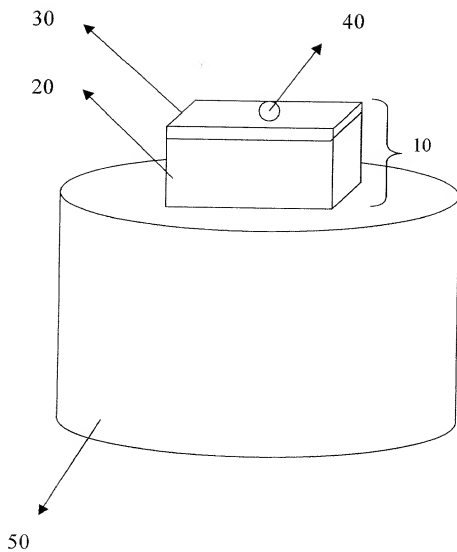
21. The process of Claim 19 wherein the tray cover
further comprises a humidity indicator device.

Abstract

A packaging container for electronic components, particularly integrated circuits, which includes a tray into which the integrated circuits can be secured, a tray cover which is secured onto the tray, wherein the tray cover is composed of a plastic material, a desiccating material and an electrostatic dissipating product. The tray cover may further include a humidity indicating system incorporated into the tray cover. The packaging container may also be placed within a water and moisture-proof barrier bag for shipment purposes.

SRC:sb:dg
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93420
8-28-00

Figure 1



009230*00661960

Figure 2

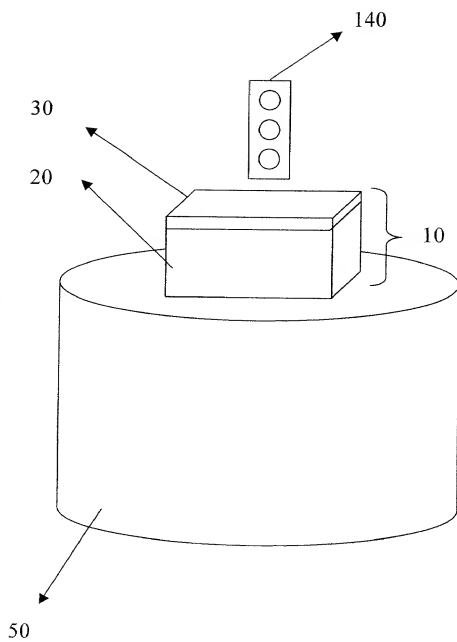


Figure 3: Prior art

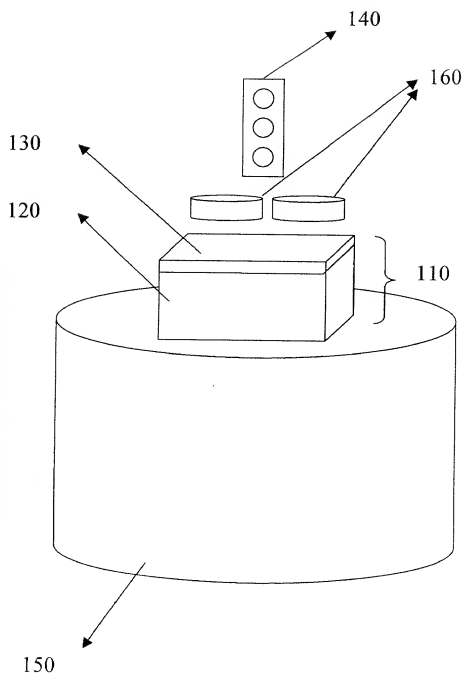
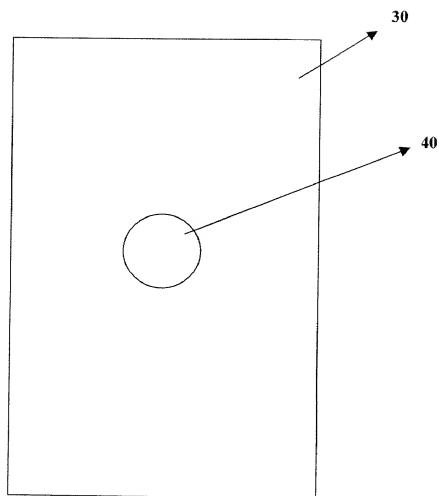
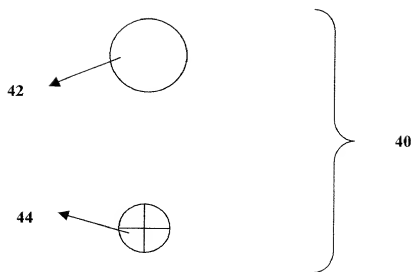


Figure 4:



000230-EO664960

Figure 5:



008230" 80667960

000220*20664960

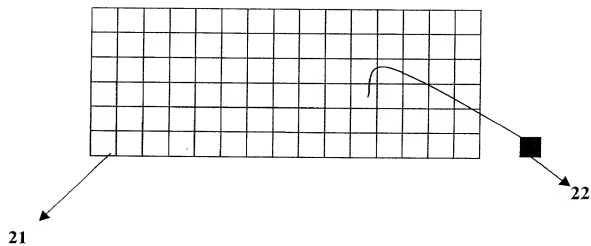


FIGURE 6

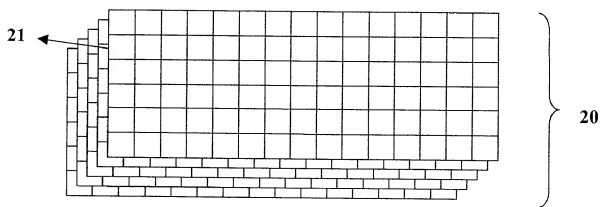


FIGURE 7

Practitioner's Docket No. P-1000**PATENT****COMBINED DECLARATION AND POWER OF ATTORNEY**(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,
CONTINUATION, OR C-I-P)

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item below)

- ☒ original.
- ☐ design.
- ☐ supplemental.

NOTE: If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.

- ☐ national stage of PCT.

NOTE: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.

NOTE: See 37 C.F.R. § 1.63(d) (continued prosecution application) for use of a prior nonprovisional application declaration in the continuation or divisional application being filed on behalf of the same or fewer of the inventors named in the prior application.

- ☐ divisional.
- ☐ continuation.

NOTE: Where an application discloses and claims subject matter not disclosed in the prior application, or a continuation or divisional application names an inventor not named in the prior application, a continuation-in-part application must be filed under 37 C.F.R. § 1.53(b) (application filing requirements — nonprovisional application).

- ☐ continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTIONPackaging Container for Electronic Components

03649473-032300

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b), or (c))

(a) ☒ is attached hereto.

NOTE: "The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

"(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;

"(2) name of inventor(s), and attorney docket number which was on the specification as filed; or

"(3) name of inventor(s), and title which was on the specification as filed."

Notice of July 13, 1995 (1177 O.G. 60).

(b) ☐ was filed on _____, as ☐ Serial No. 0 / _____
or ☐ _____
and was amended on _____ (if applicable).

NOTE: Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

NOTE: "The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

"(1) name of inventor(s), and application number (consisting of the series code and the serial number; e.g., 08/123,456);

"(2) name of inventor(s), serial number and filing date;

"(3) name of inventor(s) and attorney docket number which was on the specification as filed;

"(4) name of inventor(s), title which was on the specification as filed and filing date;

"(5) name of inventor(s), title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or

"(6) name of inventor(s), title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number; e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration."

Notice of July 13, 1995 (1177 O.G. 60), M.P.E.P. § 601.01(a), 6th ed., rev. 3.

(c) ☐ was described and claimed in PCT International Application No. _____, filed on _____ and as amended under PCT Article 19 on _____ (if any).

SUPPLEMENTAL DECLARATION (37 C.F.R. § 1.67(b))

(complete the following where a supplemental declaration is being submitted)

- ☐ I hereby declare that the subject matter of the
- ☐ attached amendment
 - ☐ amendment filed on _____

was part of my/our invention and was invented before the filing date of the original application, above-identified, for such invention.

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

- ☒ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and
- ☐ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

PRIORITY CLAIM (35 U.S.C. §§ 119(a)-(d))

NOTE: "The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in 35 U.S.C. 119(b) must be filed in the case of an interference (§ 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other situations, before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(f). If the certified copy is not in the English language, a translation need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate." 37 C.F.R. § 1.55(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §§ 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

- (d) ☒ no such applications have been filed.
- (e) ☐ such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

(Declaration and Power of Attorney [1-1]—page 3 of 7)

09649403, 0823000

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)**

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>

CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(34 U.S.C. § 119(e))

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER

FILING DATE

____ / _____
____ / _____
____ / _____

**CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S)
UNDER 35 U.S.C. 120**

- ☐ The claim for the benefit of any such applications are set forth in the attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN PART (C-I-P) APPLICATION.

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete **ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION** for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

Scott R. Cox
Reg. No. 31,945

(check the following item, if applicable)

- ☒ I hereby appoint the practitioner(s) associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.
- ☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named practitioner(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO

DIRECT TELEPHONE CALLS TO:
(Name and telephone number)

☒ Address
Scott R. Cox
LYNCH, COX, GILMAN & MAHAN, PSC
400 West Market, Suite 2200
Louisville, Kentucky 40202

Scott R. Cox
LYNCH, COX, GILMAN & MAHAN, PSC
(502) 589-4215

☐ Customer Number _____

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

Full name of sole or first inventor

Stefan O. Dick
(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

Inventor's signature _____

Date Aug 23 2000 Country of Citizenship German

Residence 8204 William Moyers Ave, NE

Post Office Address Albuquerque, NM 87122

Stefan Dick

Full name of second joint inventor, if any

Michelle B. Martin
(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

Inventor's signature _____

Date Aug 23 2000 Country of Citizenship United States

Residence 2450 Verna Court

Post Office Address Palm Springs, CA 92262

Full name of third joint inventor, if any

Roger Nobilet
(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

Inventor's signature _____

Date 08/24/00 Country of Citizenship France

Residence 1 Rue Beauregard

Post Office Address 77200 Torcy, France

(check proper box(es) for any of the following added page(s)
that form a part of this declaration)

- ☒ **Signature** for fourth and subsequent joint inventors. Number of pages added
1

* * *

- ☐ **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. Number of pages added _____

* * *

- ☐ **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. Number of pages added _____

* * *

- ☐ Added page for **signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)

* * *

- ☐ Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.

☐ Number of pages added _____

* * *

- ☐ Authorization of practitioner(s) to accept and follow instructions from representative.

* * *

(If no further pages form a part of this Declaration,
then end this Declaration with this page and check the following item)

- ☐ This declaration ends with this page.

**ADDED PAGE TO COMBINED DECLARATION AND POWER OF
ATTORNEY FOR SIGNATURE BY FOURTH AND SUBSEQUENT
INVENTORS**

Full name of fourth joint inventor, if any

Frederic
(GIVEN NAME)

MIDDLE INITIAL OR NAME:

Bouvier

FAMILY (OR LAST NAME)

Inventor's signature

Date 08/24/00 Country of Citizenship France

Residence Petit champ et grand pre

Post Office Address 38420 Revel, France

Full name of fifth joint inventor, if any

(GIVEN NAME)

(MIDDLE INITIAL OR NAME)

FAMILY (OR LAST NAME)

Inventor's signature

Date _____ Country of Citizenship _____

Inventor's signature _____

Date _____ Country of Citizenship _____

Residence _____

Post Office Address _____

Full name of sixth joint inventor, if any

(GIVEN NAME)

(MIDDLE INITIAL OR NAME)

FAMILY (OR LAST NAME)

Inventor's signature

Date _____ Country of Citizenship _____

Inventor's signature _____

Date _____ Country of Citizenship _____

Residence _____

Post Office Address _____